OM-216 386S 2010–11

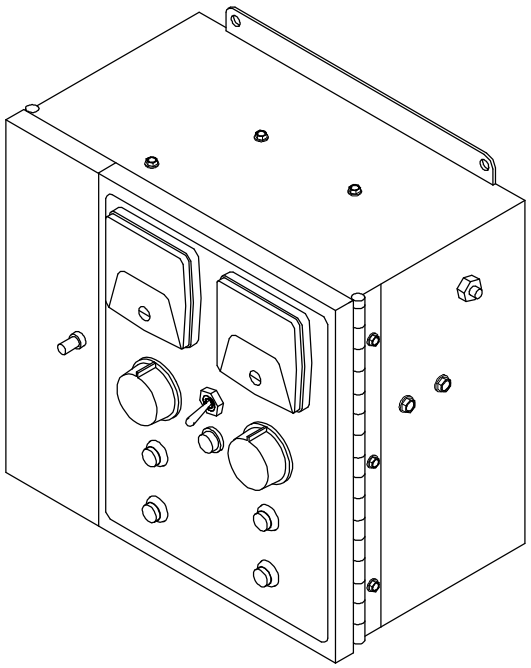
Processes

Submerged (SAW) Welding

Description

Submerged Arc Controller For Automatic Welding

HDC 1500A CE



50, 60 Hz

OWNER'S MANUAL

File: SUBMERGED (SAW)

Visit our website at

www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

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TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

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TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING 1
1-1. Symbol Usage 1
1-2. Arc Welding Hazards 1
1-3. Additional Symbols For Installation, Operation, And Maintenance 3
1-4. California Proposition 65 Warnings 4
1-5. Principal Safety Standards 4
1-6. EMF Information 4
SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION 5
2-1. Symboles utilisés 5
2-2. Dangers relatifs au soudage à l'arc 5
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance 7
2-4. Proposition californienne 65 Avertissements 8
2-5. Principales normes de sécurité 9
2-6. Informations relatives aux CEM 9
SECTION 3 – DEFINITIONS 11
3-1. Symbols And Definitions 11
3-2. WEEE Label (For Products Sold Within The EU) 11
SECTION 4 – SPECIFICATIONS 12
4-1. Weld Control 12
4-2. Description 12
SECTION 5 – INSTALLATION 13
5-1. Important Information Regarding CE Products (Sold Within The EU) 13
5-2. Serial Number And Rating Label Location 13
5-3. Typical Equipment Location 13
5-4. Mounting Hole Layout 14
5-5. Typical Connection Diagram With Miller Power Sources 15
5-6. Left Side Panel Connections 16
5-7. Terminal Block TB1 And TB2 Connections 17
5-8. Terminal Block TB1 Connection Information 18
5-9. Terminal Block TB2 Connection Information 18
5-10. Connection Of 115 VAC Flux Hopper Without Plug 19
5-11. Remote 10 Receptacle RC2 Information 20
5-12. Remote 14 Receptacle RC1 Information 20
5-13. Remote 4 Receptacle RC3 Information 21
5-14. Remote Voltage Sense Leads Placement Guidelines For A Single Arc (Required) 22
5-15. Remote Voltage Sense Leads Placement Guidelines For Multiple Arcs 23
5-16. Recommended Power Sources 24
SECTION 6 – OPERATION 25
6-1. Front Panel Controls (Use With Section 6-2) 25
6-2. Description Of Controls (Use With Section 6-1) 26
6-3. Amperage Control Sensitivity 27
6-4. Voltage Control Sensitivity 28
6-5. Inside Panel Controls 29
SECTION 7 – MAINTENANCE & TROUBLESHOOTING 30
7-1. Routine Maintenance 30
7-2. Supplementary Protector CB1 30
SECTION 8 – ELECTRICAL DIAGRAM 32
SECTION 9 – PARTS LIST 33
WARRANTY

DECLARATION OF CONFORMITY

for European Community (CE marked) products.

MILLER Electric Mfg. Co., 1635 Spencer Street, Appleton, WI 54914 U.S.A. declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

Product	Stock Number
HDC 1500 A	300439

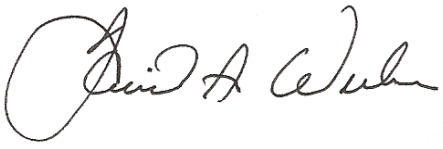
Council Directives:

- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility

Standards:

- IEC 60974-1:2005 Arc welding equipment – Part 1: Welding power sources
- IEC 60974-5:2007 Arc welding equipment – Part 5: Wire feeders
- IEC 60974-10:2007 Arc Welding Equipment – Part 10: Electromagnetic compatibility (EMC) requirements
- EN 50445:2008 Product family standard to demonstrate compliance of equipment for resistance welding, arc welding and allied processes with the basic restrictions related to human exposure to electromagnetic fields (0 Hz – 300Hz)

Signatory:



November 19, 2010

David A. Werba

Date of Declaration

MANAGER, PRODUCT DESIGN COMPLIANCE

250367A

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

DANGER! – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *– Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter welding power sources AFTER removal of inputpower.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

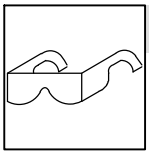
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or by-pass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

ELECTRIC AND MAGNETIC FIELDS (EMF) can affect ImplantedMedical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

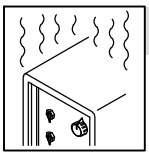
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

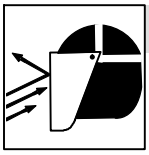
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94–110) when manually lifting heavy parts or equipment.



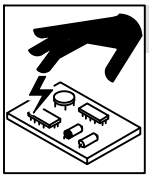
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can injure.

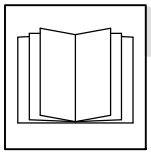
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

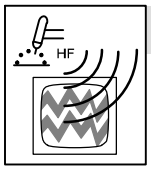
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. *Wash hands after handling.*

This product contains chemicals, including lead, known to the state of California to cause cancer, birth defects, or other reproductive harm. *Wash hands after use.*

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers–by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

Se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.

2-1. Symboles utilisés

DANGER! – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

***NOTE** – Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

2-2. Dangers relatifs au soudage à l'arc

Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.

Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.

Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.

UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez–les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien avant de toucher les pièces.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

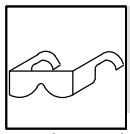
Le rayonnement de l'arc du procédé de soudag génère des rayons visibles et invisibles intense (ultraviolets et infrarouges) susceptibles de provoquer des brûlure dans les yeux et sur la peau. Des étincelles sont projetées pendant l soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Une fois le travail achevé, assurez–vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe–circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non-utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.

LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.

LES BOUTEILLES peuvent exploser si elles sont endommagées.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

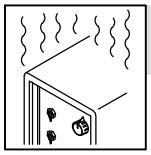
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

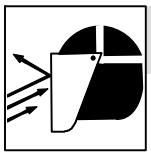
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication Nº94–110) lors du levage manuelle de pièces ou équipements lourds.



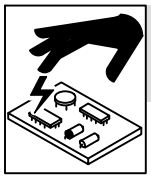
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

Les PIÈCES MOBILES peuvent causer des blessures.

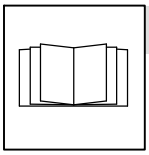
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

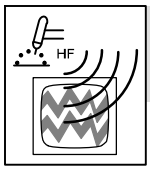
Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



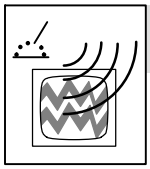
LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements

⚠ Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)

⚠ Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.

⚠ Ce produit contient des produits chimiques, notamment du plomb, dont l'État de Californie reconnaît qu'ils provoquent des cancers, des malformations congénitales ou d'autres problèmes de procréation. *Se laver les mains après utilisation.*

Pour les moteurs à essence :

⚠ Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.

Pour les moteurs diesel :

⚠ Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site internet : www.global.ihs.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, Quincy, MA 02269 (téléphone : 800-344-3555, site Internet : www.nfpa.org et www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (téléphone : 703-788-2700, site Internet : www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (téléphone : 800-463-6727, site internet : www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 25 West 43rd Street, New York, NY 10036 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux–le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (téléphone : 301-504-7923, site internet : www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (télé[hone : 1-800-232-4636, site internet: www.cdc.gov/NIOSH).

2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

En ce qui concerne les implants médicaux :

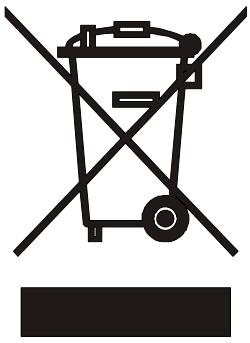
Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – DEFINITIONS

3-1. Symbols And Definitions

A	Amperes		Remote		Output	Hz	Hertz
V	Volts	V	Input	1	Single Phase Alternating Current	I_2	Rated Welding Current
%	Percent		Circuit Protector		Increase/Decrease Of Quantity		Wire Feed Speed
	Protective Earth (Ground)	t_2	Postflow Timer	t_1	Preflux Timer		Start Time
	Start		Stop	U_1	Primary Voltage	IP	Degree Of Protection
X	Duty Cycle	I_1	Rated Supply Current		Line Connection	U_2	Conventional Load Voltage
I	On	O	Off		Wire Feed Inch Down		Wire Feed In Up
	Crater Time		Program		Flux		

3-2. WEEE Label (For Products Sold Within The EU)



Do not discard product (where applicable) with general waste.

Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility.

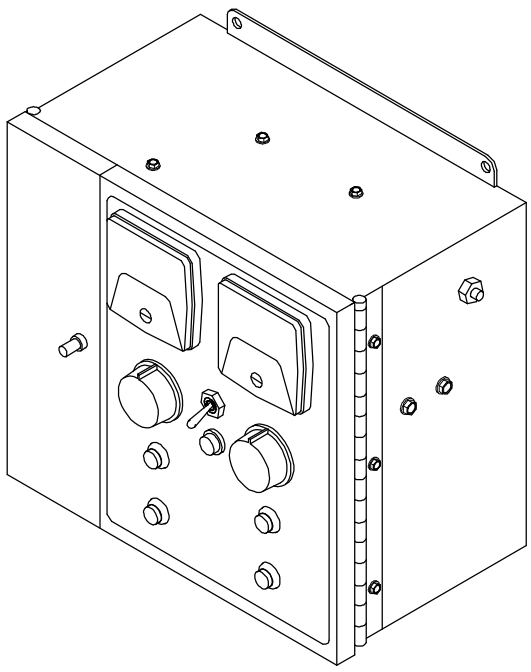
Contact your local recycling office or your local distributor for further information.

SECTION 4 – SPECIFICATIONS

4-1. Weld Control

Specification	Description
Type Of Input Power From Welding Power Source	Single-Phase 115 Volts AC, 10 Amperes, 50/60 Hertz
Welding Power Source Type	Constant Current (CC), Constant Voltage (CV), AC Or DC
Welding Processes	Submerged Arc (SAW) Welding
Overall Dimensions Including Knobs, Receptacles, Etc.	Weld Control — Height: 11.5 in. (292 mm); Width: 12.5 in. (318 mm); Depth: 7 in. (178 mm)
Weight	Weld Control — Net: 25.5 lb (11.6 kg)
Weld Voltage And Amperage Capacity (AC Or DC)	0 To 60 Volts 0 To 1500 Amperes
Wire Feed Speed Range	Dependent On Motor In System
IP Rating	21

4-2. Description



803 021-C

This weld control is designed to automatically cycle welding events while maintaining constant wire feed speed. This unit can be used with constant current, constant voltage, AC or DC welding power sources. Normally open relay contacts that work in conjunction with the weld cycle are available to interface with other equipment (such as fixtures and flux valves). See Section 5-7 and 5-9 for connection information on TB2.

For information on the wire drive assembly, see Owner's Manual supplied with the assembly.

SECTION 5 – INSTALLATION

5-1. Important Information Regarding CE Products (Sold Within The EU)

A. Information On Electromagnetic Fields (EMF)

This equipment shall not be used by the general public as the EMF limits for the general public might be exceeded during welding.

This equipment is built in accordance with EN 60974–1 and is intended to be used only in an occupational environment (where the general public access is prohibited or regulated in such a way as to be similar to occupational use) by an expert or an instructed person.

Wire feeders and ancillary equipment (such as torches, liquid cooling systems and arc striking and stabilizing devices) as part of the welding circuit may not be a major contributor to the EMF. See the Owner's Manuals for all components of the welding circuit for additional EMF exposure information.

- The EMF assessment on this equipment was conducted at 0.5 meter.
- At a distance of 1 meter the EMF exposure values were less than 20% of the permissible values.

B. Information On Electromagnetic Compatibility (EMC)

This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low–voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

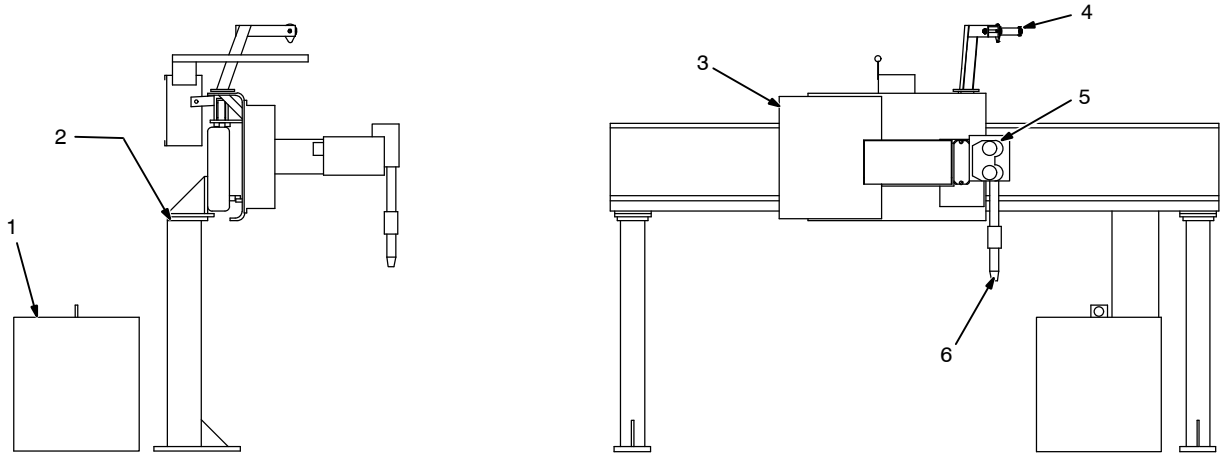
ce-emc 3 2010-10

5-2. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the rear panel. Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

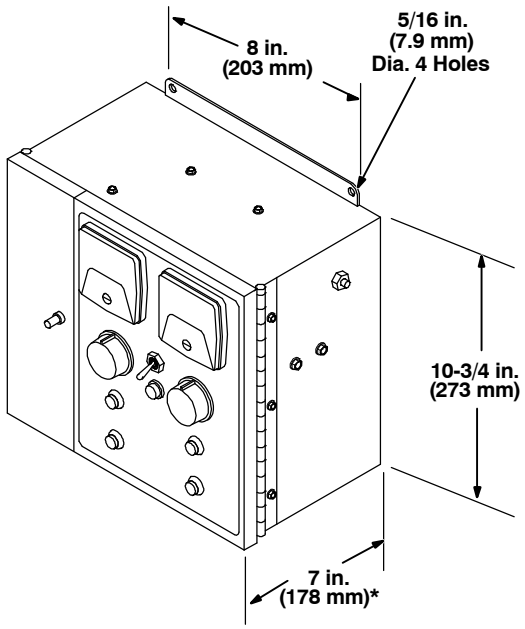
5-3. Typical Equipment Location

1 Welding Power Source
2 Side Beam
3 Weld Control
4 Spool Support
5 Wire Drive Assembly
6 Automatic Welding Gun



Ref. 131 138-A

5-4. Mounting Hole Layout



*** Includes front panel knobs**

803 021-C

Notes

5-5. Typical Connection Diagram With Miller Power Sources

☞ *Customer must supply the following: power source, power source control cable, wire drive assembly, wire drive assembly cable, drive rolls, gun, welding wire, weld cables, remote voltage sense leads and flux system for the desired application.*

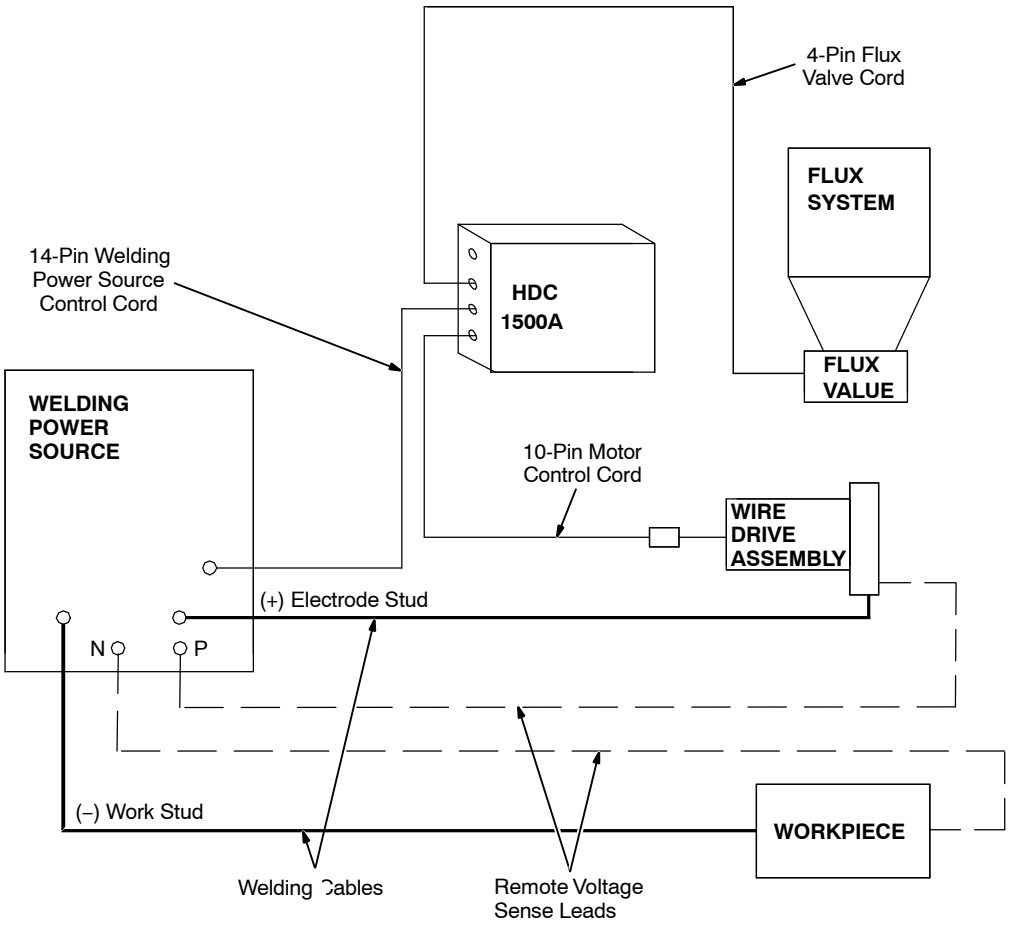
Turn Off welding power source and weld control and disconnect input power before making connections.

☞ *Use remote voltage sense leads in all applications.*

☞ *Suggested size remote voltage sense wire is 12 gauge or higher.*

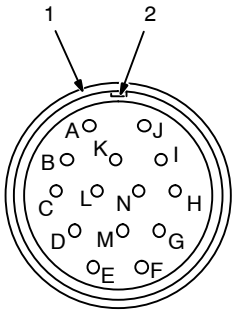
☞ *See power source owners manual for sense lead terminal strip location and connection.*

☞ *For DCEN (straight polarity) observe sense lead relationship with power source output polarity. Example - N to (–) or work output stud and P to (+) or electrode output stud.*

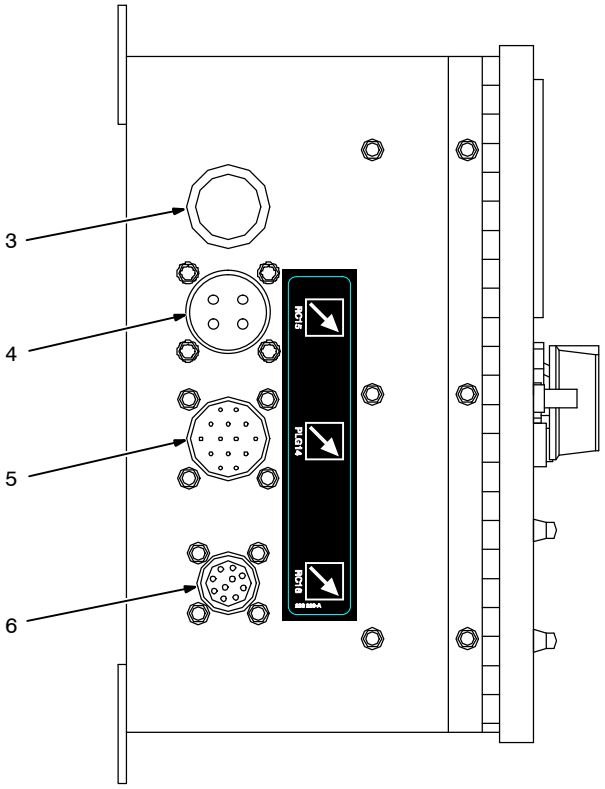


DCEP (Reverse Polarity) Connection

5-6. Left Side Panel Connections



Example Receptacle



1 Receptacle

2 Keyway

3 Access Holes - For Customer Use: Connections To Terminal Strips, Flux Valve, etc.

⚠ **Turn Off welding power source and weld control and disconnect input power before opening access door.**

☞ *Install strain relief (customer supplied) in access hole.*

Route incoming cables through user access hole prior to making connections to internal terminal strips.

4 4-Pin Receptacle: Connection To Flux Hopper/Shielding Gas Valve.

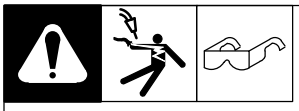
5 14-Pin Receptacle: Connection To Welding Power Source.

6 10-Pin Receptacle: Connection to Wire Drive Motor

To connect matching interconnecting cord to one of the above receptacles, align keyway, insert plug, and tighten threaded collar. Connect remaining end of cord to matching receptacle on applicable equipment.

Ref. 803 022-D

5-7. Terminal Block TB1 And TB2 Connections



Turn Off welding power source and weld control and disconnect input power before opening access door.

1 Access Door

Remove securing screw and open access door.

2 Terminal Block TB2

3 Terminal Block TB1

4 Securing Screw - Terminal Block

5 Stripped Lead

6 Typical Lead Being Connected To Terminal Block

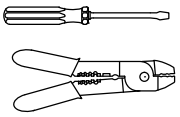
7 Access Hole - (Located in Left Side of Unit) Used For Connections To Terminal Blocks, Flux Valve, etc.

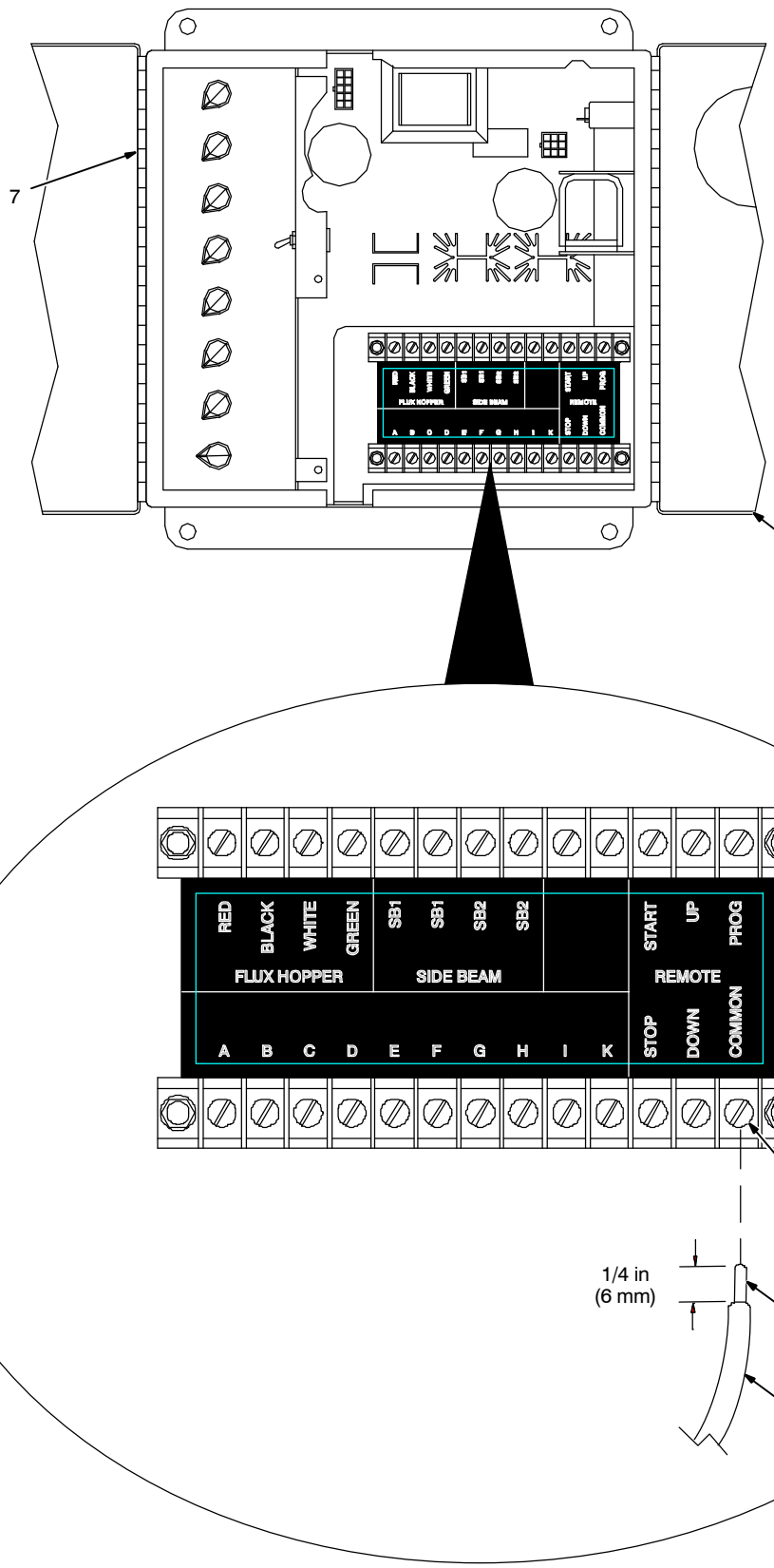
☞ *Install strain relief (customer supplied) in access hole.*

Strip 1/4 in (6 mm) insulation off end of lead, insert end into proper location on TB1 and TB2. Tighten applicable securing screw.

Close and secure access door.

Tools Needed:





Ref. 803 699-B

5-8. Terminal Block TB1 Connection Information

Terminal/Number	Receptacle Location	Function Information
A	A on 14-Pin	A normally open set of relay contacts connect terminal A to terminal B when Start is pressed and pre-flux timer times out (contacts are rated 10 amperes, 125 volts AC).
B	B on 14-Pin	
C	C on 14-PIn	Remote command reference from welding power source.
D	D on 14-Pin	Remote circuit common.
E	E on 14-PIn	Output command to welding power source (0 to 10 volts DC).
G	G on 14-PIn	Circuit common for 24 and 115 volts AC circuits.
I	I on 14-PIn	115 volts AC from welding power source, which is present whenever welding power source is on.
F	F on 14-PIn	Current feedback input (1 volt DC per 100 amperes).
H	H on 14-PIn	Voltage feedback input (1 volt DC per 10 arc volts).
K	K on 14-PIn	Chassis common.
Remote Stop	When connected to remote common, stops the weld cycle.	
Remote Jog Down	When connected to remote common, jogs wire down.	
Remote Common	Circuit common for remote capabilities.	

5-9. Terminal Block TB2 Connection Information

Terminals	Function Information
Red	115 volts AC to power flux hopper.
Black	Switched 115 volts AC to power flux hopper.
White	Circuit common for 115 volts AC for flux hopper.
Green	Chassis common for flux hopper.
Side Beam 1 Relay	Normally open set of contacts* that close when power source contactor energizes after the Start button is pressed and preflux has timed out. Contacts open again when the Stop button is pressed.
Side Beam 2 Relay	Normally open set of contacts* that close when an arc is established. These contacts are used when you want the side beam to start moving once an arc has been established. Contacts open again when the Stop button is pressed.
Remote Start	When connected to remote common, starts the weld cycle.
Remote Jog Up	When connected to remote common, jogs wire up.
Remote Program	When connected to remote common, reverses direction of motor.
* NOTE: All contacts are rated 10 amperes, 125 volts AC.	

5-10. Connection Of 115 VAC Flux Hopper Without Plug

Turn Off welding power source and weld control and disconnect input power before opening access door.

1 Access Door

Remove securing screw and open access door.

2 Terminal Block TB2

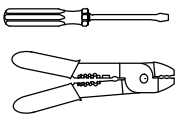
3 Access Hole - (Located in Left Side of Unit) Used For Connections To Terminal Blocks, Flux Valve, etc.

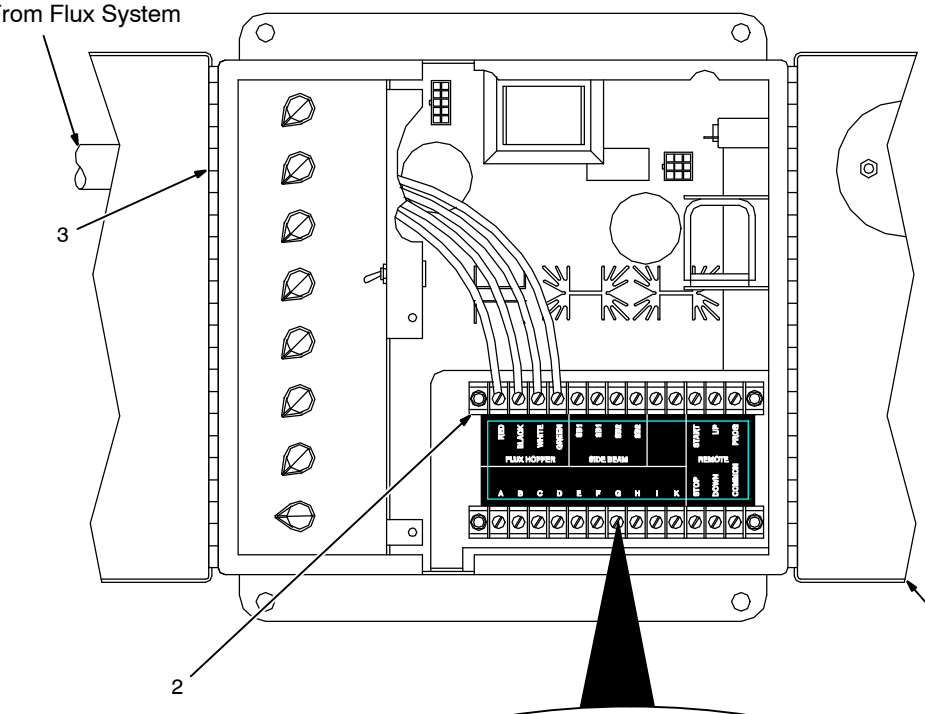
☞ *Install strain relief (customer supplied) in access hole.*

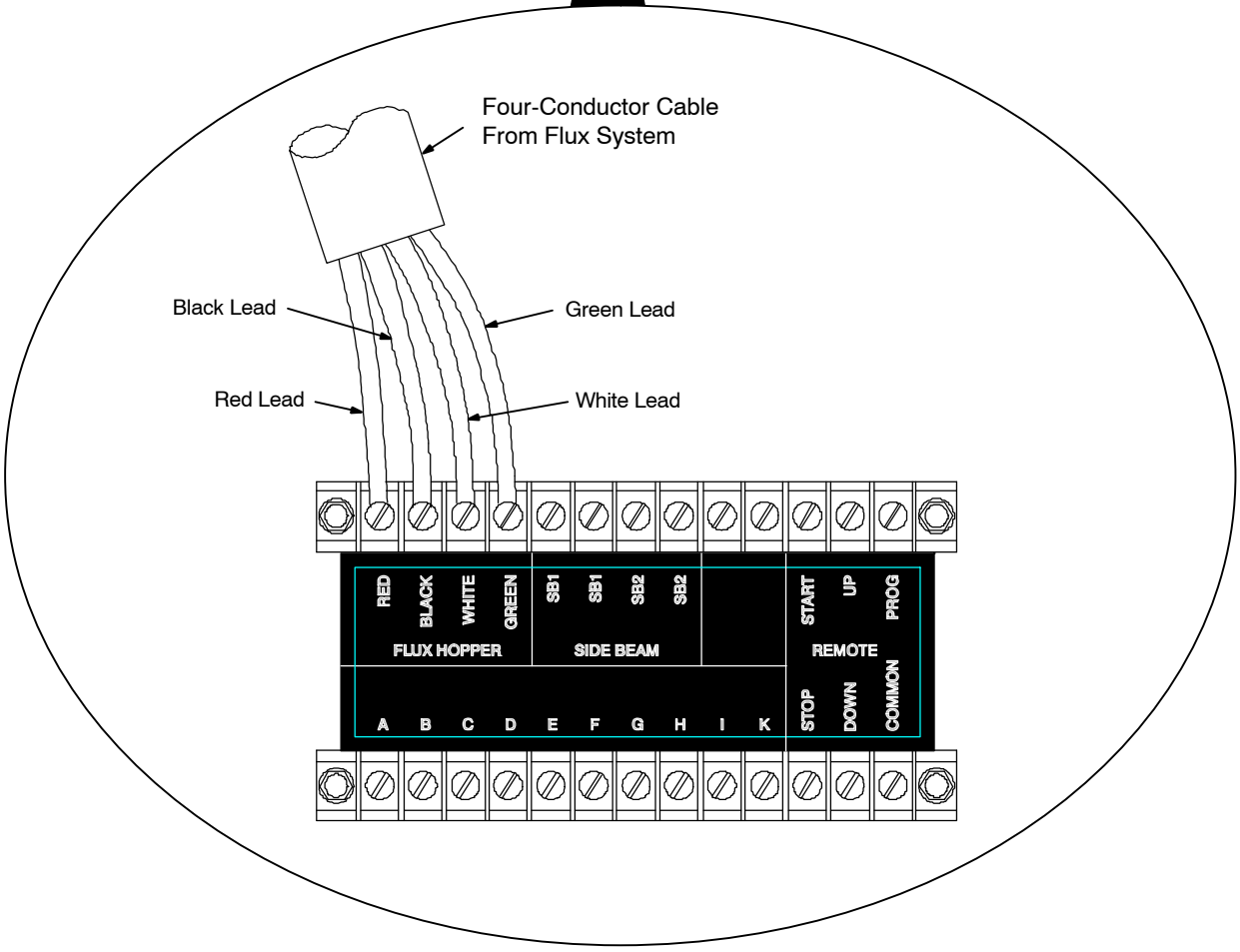
Strip 1/4 in (6 mm) insulation off end of leads. Insert four-conductor cables from flux system through access hole, and make connections as shown.

Close and secure access door.

Tools Needed:





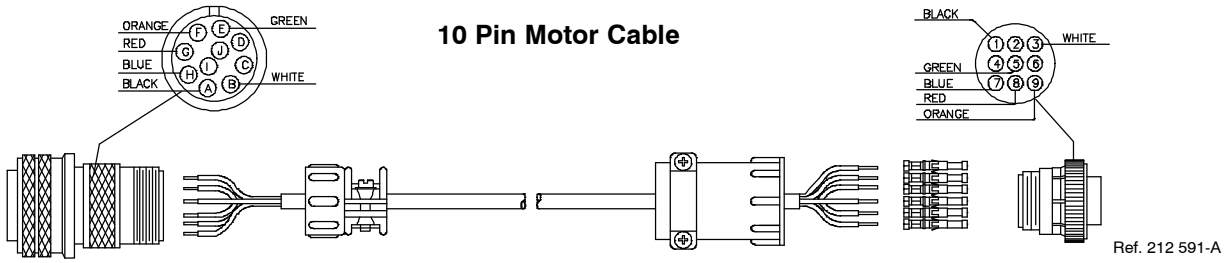


Ref. 803 700-B

5-11. Remote 10 Receptacle RC2 Information

REMOTE 10	Socket	Socket Information
Wirefeed Drive Motor Hookups	A	To positive (+) motor armature (115 volts DC motor).
	B	To negative (–) motor armature (115 volts DC motor).
	C	To motor field.
	D	To motor field.
	E	Chassis common.
	F	Tachometer feedback; 0 to +12 volts DC.
	G	12 volts DC to power tachometer
	H	Circuit common for +12 volts DC circuit.
	I	Not used.
	J	Not used.

10 Pin Motor Cable

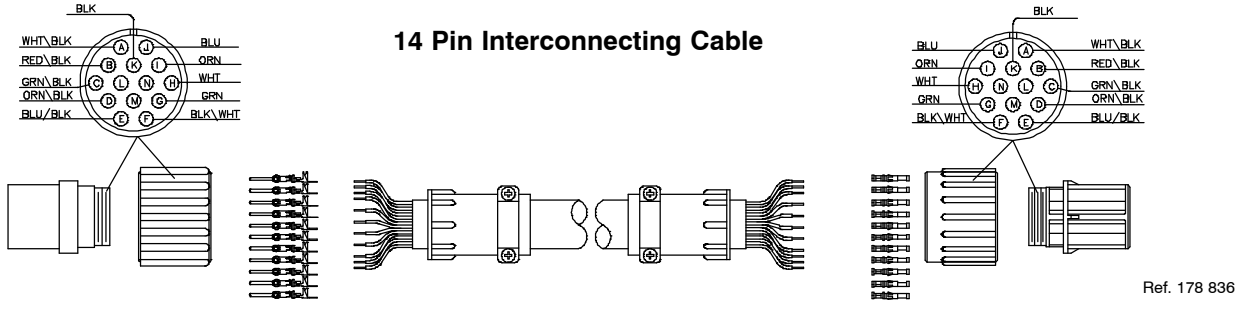


Ref. 212 591-A

5-12. Remote 14 Receptacle RC1 Information

REMOTE 14	Socket	User Accessible Via TB1 Terminal #	Socket Information
Contactor Control	A	A	24 volts AC or 115 volts AC from welding power source (present whenever power source is On).
	B	B	Normally open set of relay contacts connect A to B when Start is pressed and preflux timer has timed out.
Remote Output Control	C	C	Remote command reference from power source; +10 volts DC.
	D	D	Remote circuit common.
	E	E	Output command signal to power source; 0 to +10 volts DC.
Amperage/Voltage Feedback	F	F	Current feedback input from power source; +1 volt DC per 100 amperes.
	H	H	Voltage feedback input from power source; +1 volt DC per 10 arc volts.
Electrical Input Power	G	G	Circuit common for 24 and 115 volts AC circuits.
	I	I	115 volts AC from welding power source (present whenever welding power source is on). 115 volts AC is present on terminal block TB1 whenever welding power source is on.
GND	K	K	Chassis common.

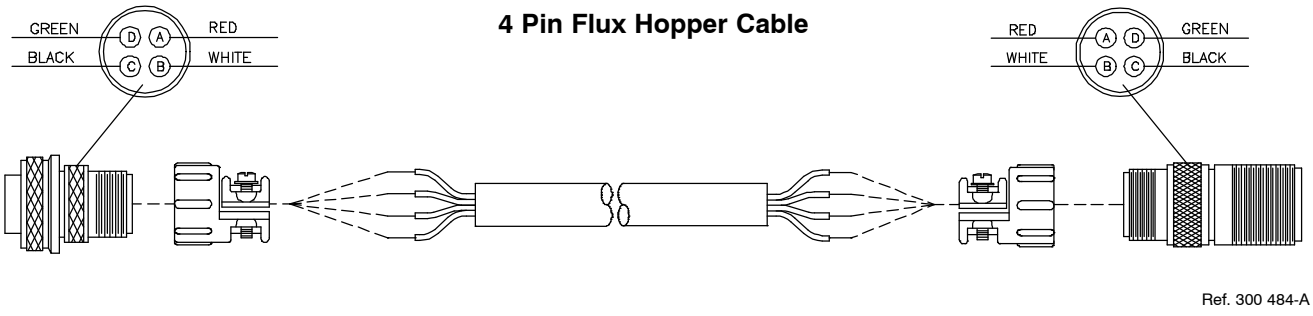
14 Pin Interconnecting Cable



Ref. 178 836

5-13. Remote 4 Receptacle RC3 Information

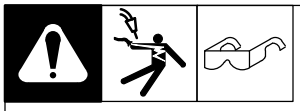
REMOTE 4	Socket	User Accessible Via TB2 Terminal #	Socket Information
Flux Hopper Hookups	A	Red	115 volts AC to power flux hopper.
	B	Black	Switched 115 volts AC to power flux hopper.
	C	White	Circuit common for 115 volts AC for flux hopper.
	D	Green	Chassis common for flux hopper.

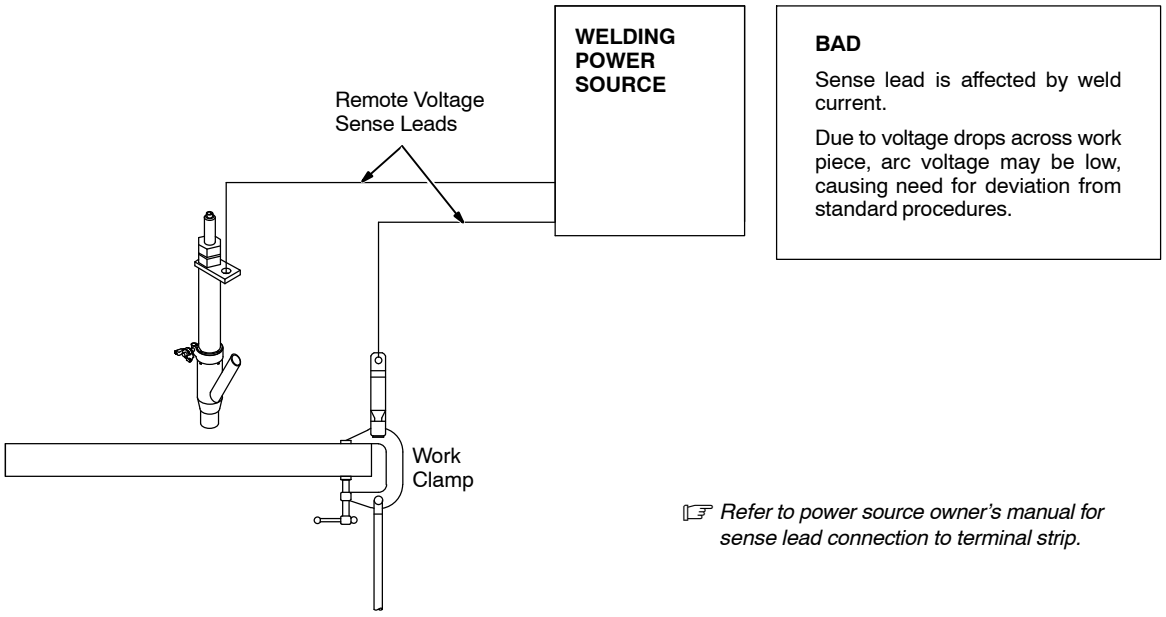


Ref. 300 484-A

Notes

5-14. Remote Voltage Sense Leads Placement Guidelines For A Single Arc (Required)



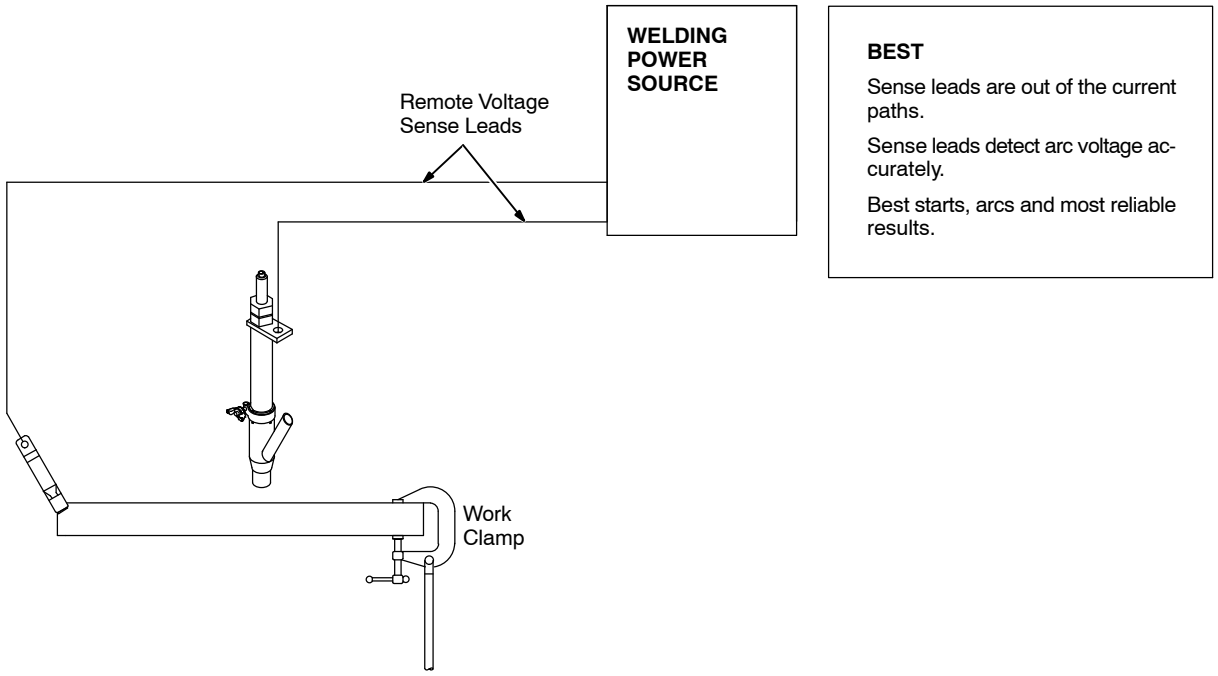


BAD

Sense lead is affected by weld current.

Due to voltage drops across work piece, arc voltage may be low, causing need for deviation from standard procedures.

☞ *Refer to power source owner's manual for sense lead connection to terminal strip.*



BEST

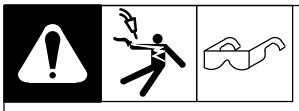
Sense leads are out of the current paths.

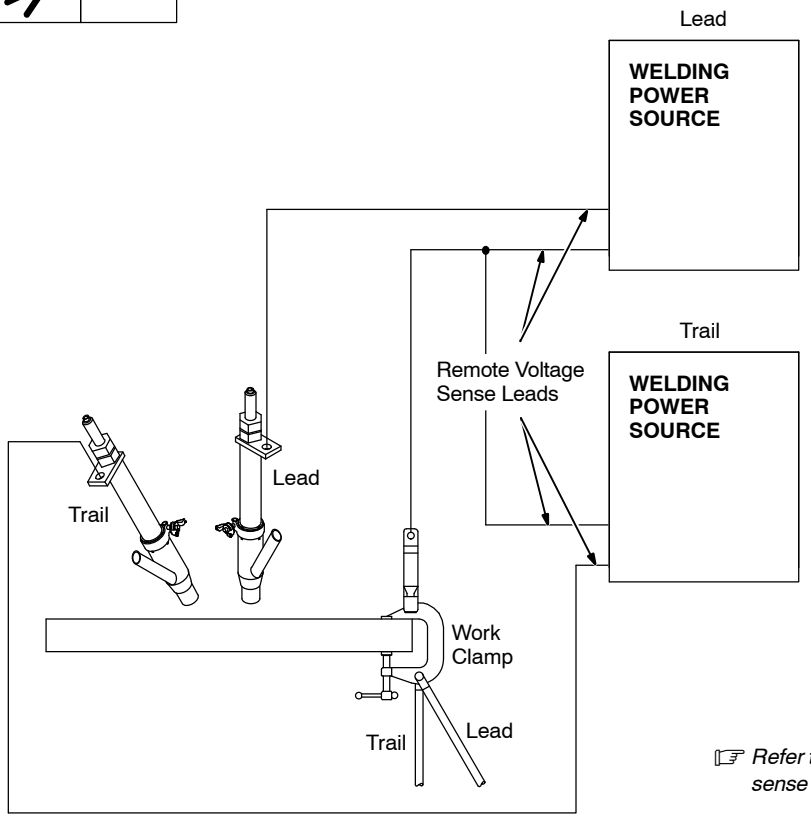
Sense leads detect arc voltage accurately.

Best starts, arcs and most reliable results.

Ref. 804 108-A

5-15. Remote Voltage Sense Leads Placement Guidelines For Multiple Arcs





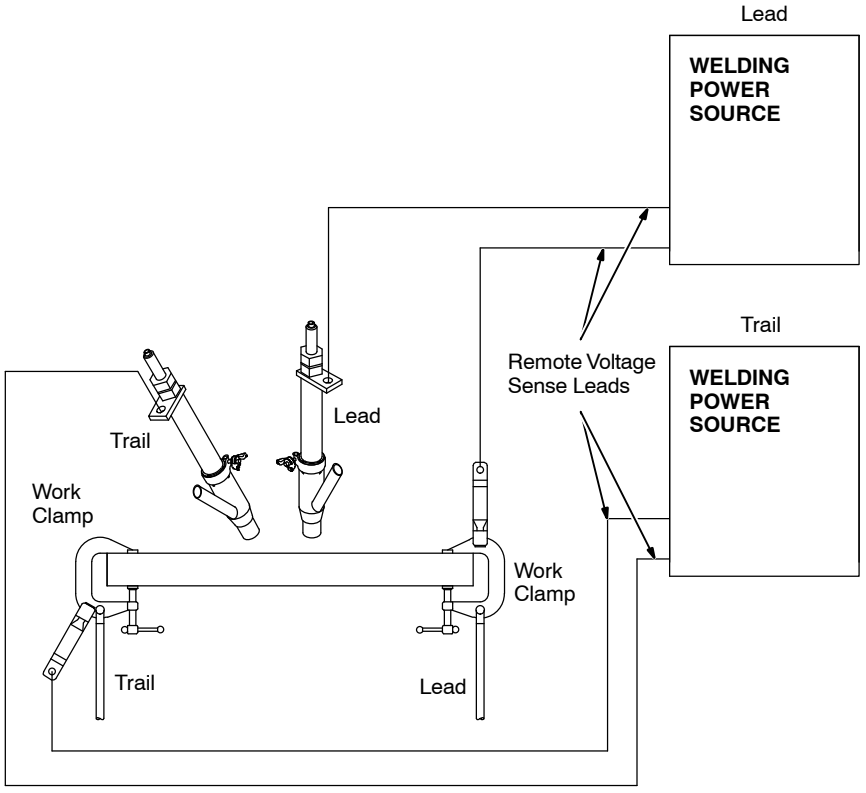
BAD

Current flow from lead affects trail sense.

Current flow from trail affects lead sense.

Neither sense lead picks up the correct work voltage, causing starting and welding arc instability.

☞ *Refer to power source owner's manual for sense lead connection to terminal strip.*



BETTER

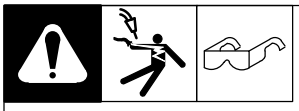
Lead sense is only affected by weld current from lead.

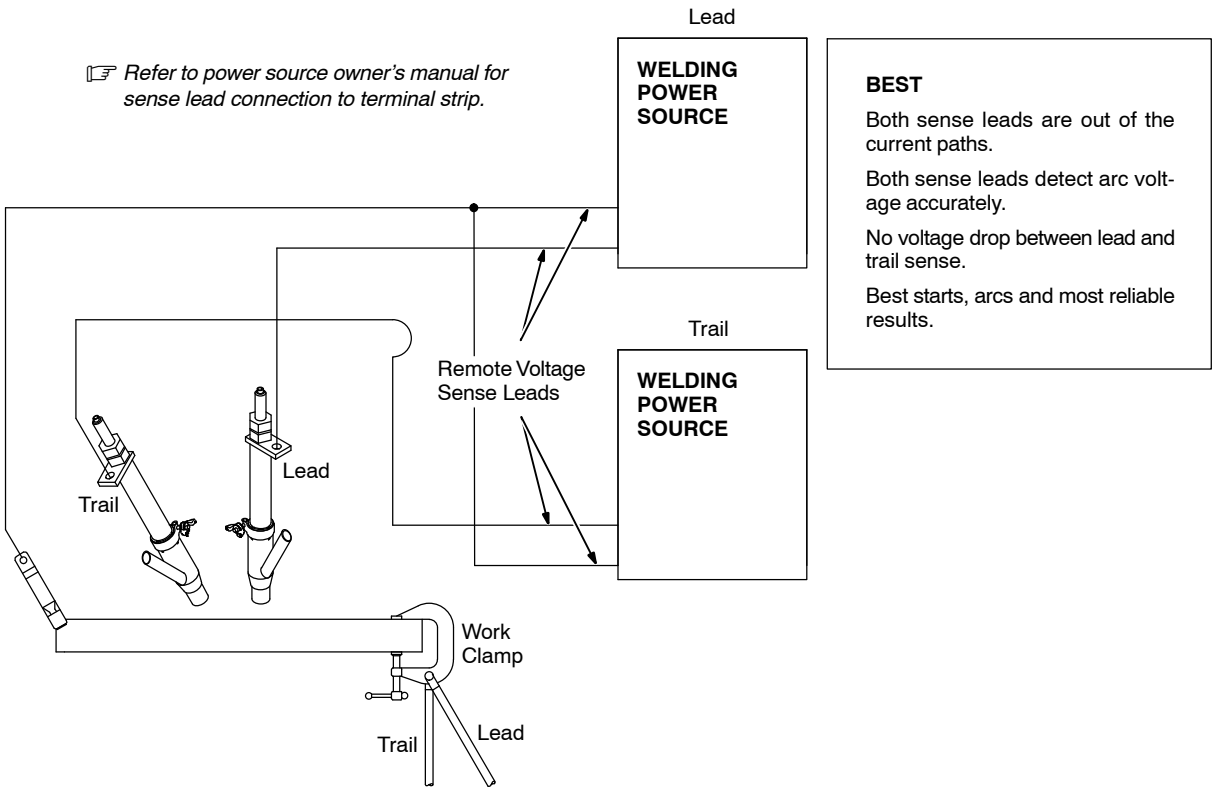
Trail sense lead is only affected by weld current from trail.

Due to voltage drops across work piece, arc voltage may be low, causing need for deviation from standard procedures.

Ref. 804 108-A

5-13. Remote Voltage Sense Leads Placement Guidelines For Multiple Arcs (Continued)





BEST

Both sense leads are out of the current paths.

Both sense leads detect arc voltage accurately.

No voltage drop between lead and trail sense.

Best starts, arcs and most reliable results.

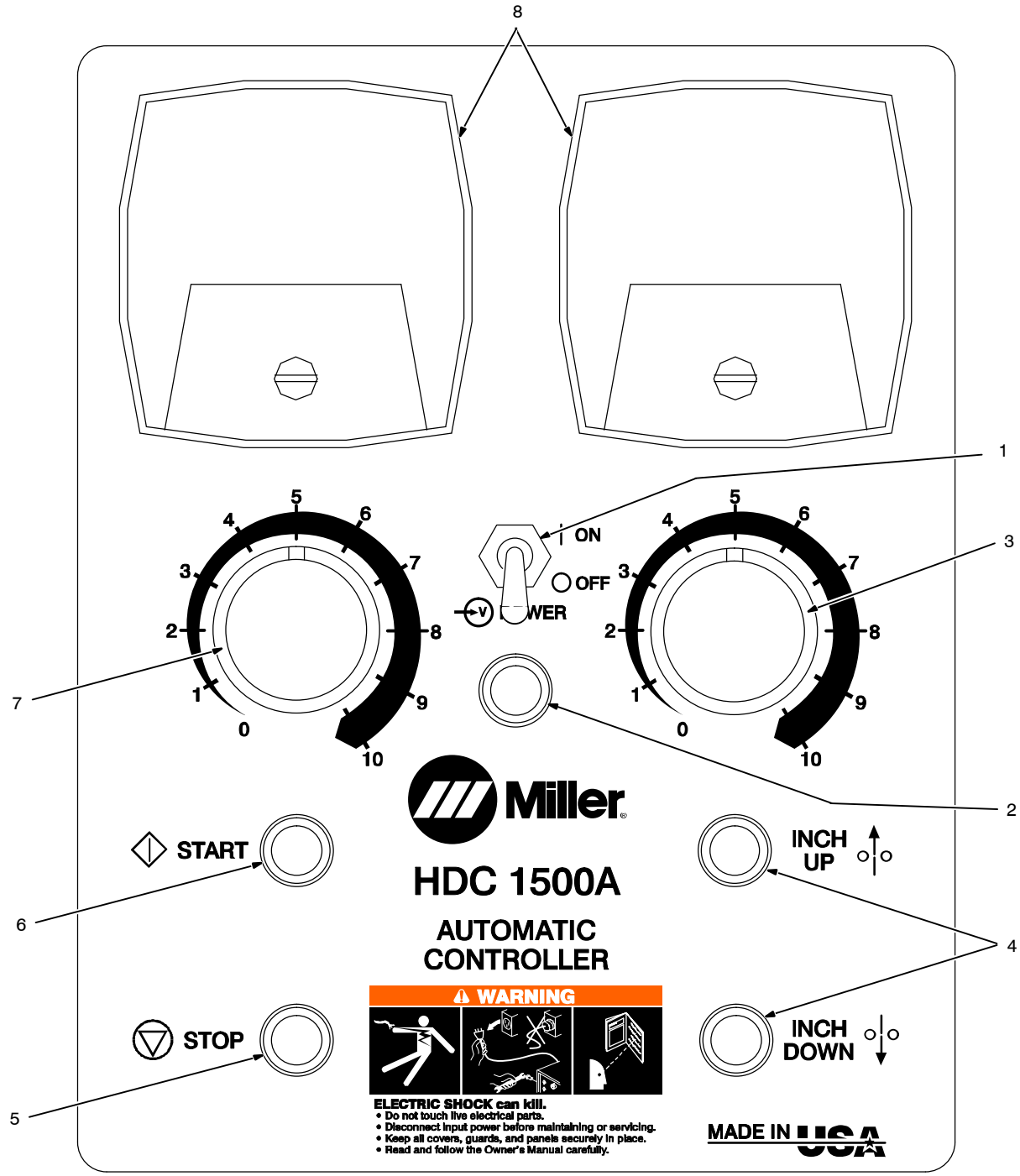
Ref. 804 108-A

5-16. Recommended Power Sources

Power Source
Summit Arc 1000
Summit Arc 1250
Dimension 652 Sub Arc
Dimension 812 Sub Arc
Dimension 1000
Dimension 1250
Sub Arc DC 650
Sub Arc DC 800
Sub Arc DC 1000
Sub Arc DC 1250

6-1. Front Panel Controls (Use With Section 6-2)

☞ *Amperage and voltage control limits may be rescaled see Section 6-2.*



202 966-F

6-2. Description Of Controls (Use With Section 6-1)

☞ *This section makes reference to Inside Panel Control which are described in Section 6-5.*

1 Power Switch

Turn switch ON to energize the HDC 1500A Controller. For this unit to operate, 115 volts AC must be supplied to this controller on pins G and I of the 14-pin receptacle. Turn switch Off to shut down the controller.

2 Power Indicator Light

Lights when Power switch is in the On position.

3 Amperage Control

If using a CC (Constant Current) machine, this control adjusts amperage. If using a CV (Constant Voltage) machine, this control adjusts wire speed.

To set "Amperage Control Sensitivity" in CV mode (See Section 6-3).

4 Inch Up/ Inch Down Switches

These Inch or Jog switches are momentary push button switches, which energize only the drive motor, allowing for a cold wire jog. The welding wire jogs at the rate set by the Jog Speed control. To advance the wire out of the torch, press the Inch Down switch. To retract the wire into the torch, press the Inch Up switch.

5 Stop Switch

Press the Stop button to end the weld cycle. Pressing this button initiates the Crater Fill and Burnback portion of the weld cycle. The Wire Feed Speed will switch to the speed set by the Crater Speed control, and the power source output will switch to the output set by Crater/Burnback Output control. The length of time the controller stays in the crater mode is set by the Crater Time control. Crater time can be set between 0 and 5 seconds. After the crater mode times out, the burnback timer starts. Burnback is the length of time the welding wire remains electrically energized after the drive motor stops, and can be set from 0 to 5 seconds with the Burnback Time control.

6 Start Switch

After pressing the Start button, the flux valve, energizes immediately. Preflux time can be adjusted from 0 to 10 seconds with the Preflux Time control. After this timer times out, the flux valve relay remains energized and the weld cycle begins. The weld continues until the Stop button is pressed.

7 Voltage Control

If using a CV (Constant Voltage) machine, this control adjusts voltage. If using a CC (Constant Current) machine, this control adjusts wire speed.

To set "Voltage Control Sensitivity" in CC mode (See Section 6-4).

8 Weld Meters

The meters are provided to monitor the welding operation (either AC or DC). They are not intended for exact voltage or amperage measurements.

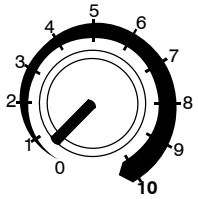
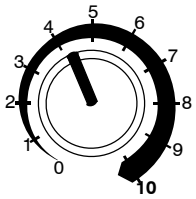
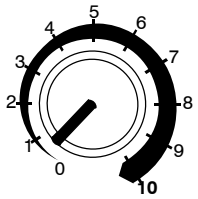
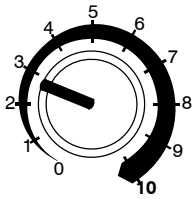
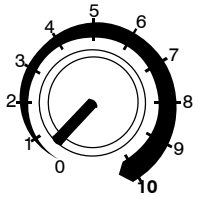
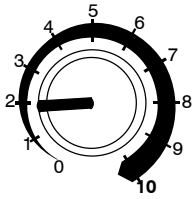
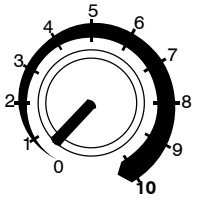
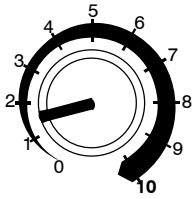
Notes

6-3. Amperage Control Sensitivity

In CV mode the amperage control is used to set wire feed speed. The sensitivity of this control can be changed (a small turn of the knob causes a large change in value to a large turn causing a comparable change in value).

Example - Reset control sensitivity for 1/8 inch diameter wire as follows:

- Turn the amperage control to approximately 0.6. (See table below).
- Press and hold the STOP button.
- While holding the STOP button, press and hold the START button.
- While holding both the STOP and START buttons, press and hold the INCH DOWN button for one second.
- Release all the buttons. The amperage control minimum is now set.
- Turn the amperage control to approximately 2.8. (See table below).
- Press and hold the STOP button.
- While holding the STOP button, press and hold the START button.
- While holding both the STOP and START buttons, press and hold the INCH UP button for one second.
- Release all the buttons. The amperage control maximum is now set.

Wire Diameter (Inches)	Amperage Control (Minimum)	Amperage Control (Maximum)
3/32	 0.6	 4.2
1/8	 0.6	 2.8
5/32	 0.5	 1.9
3/16	 0.5	 1.5

Amperage and voltage control sensitivity can be set back to the factory default by the following procedure:

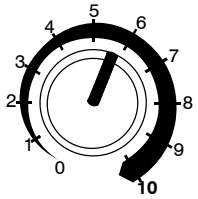
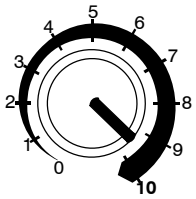
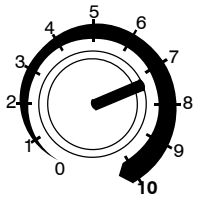
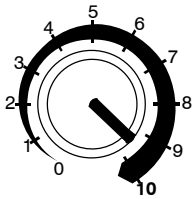
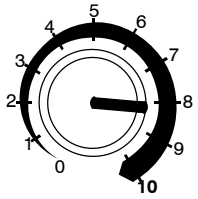
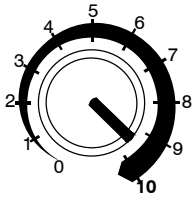
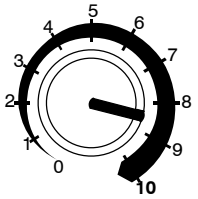
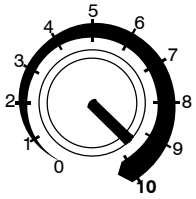
- Press and hold the STOP button.
- While holding the STOP button, press and hold the START button.
- While holding both the STOP and START buttons, press and hold both the INCH DOWN button and INCH UP button for one second.
- Release all the buttons. The amperage and voltage control limits are now reset to the factory default.

6-4. Voltage Control Sensitivity

In CC mode the voltage control is used to set wire feed speed. The sensitivity of this control can be changed (a small turn of the knob causes a large change in value to a large turn causing a comparable change in value).

Example - Reset control sensitivity for 1/8 inch diameter wire as follows:

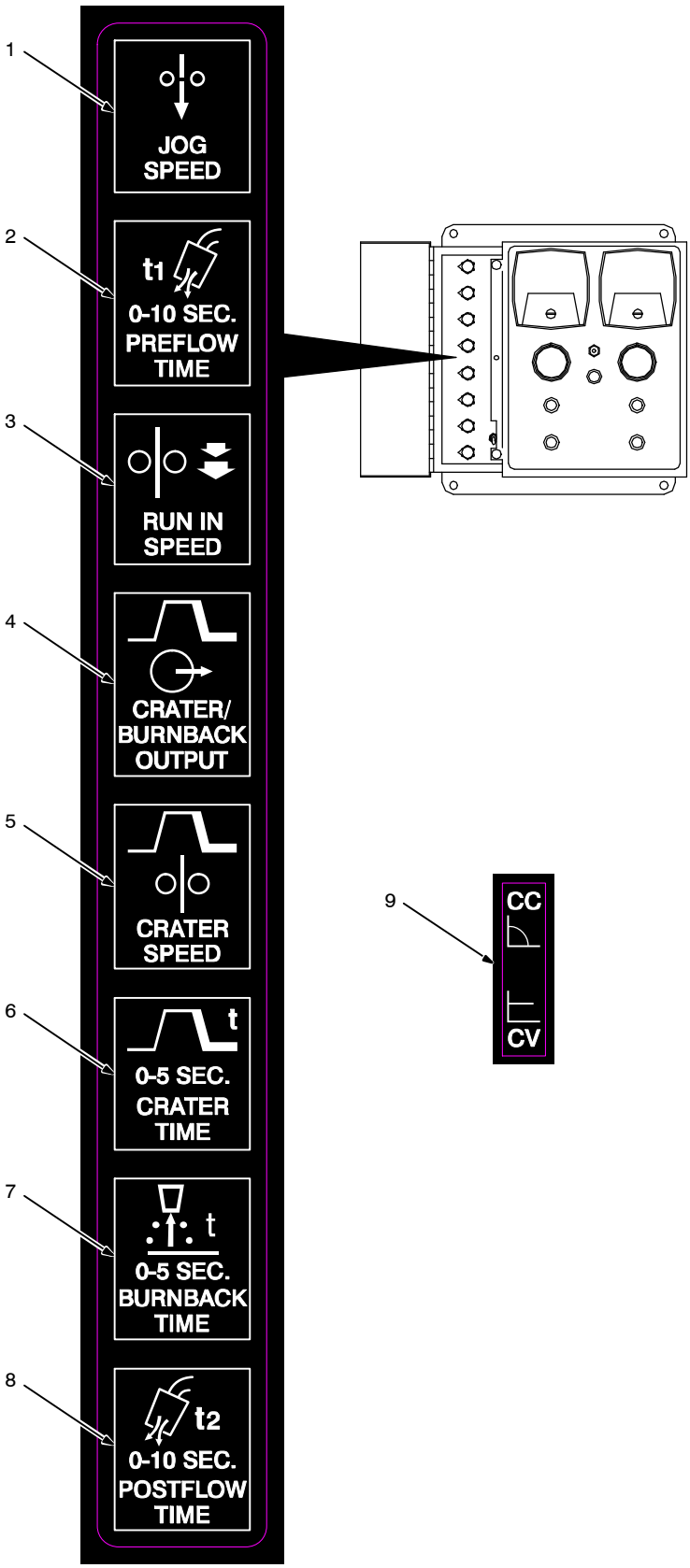
- Turn the voltage control to approximately 7.2. (See table below).
- Press and hold the STOP button.
- While holding the STOP button, press and hold the START button.
- While holding both the STOP and START buttons, press and hold the INCH DOWN button for one second.
- Release all the buttons. The voltage control minimum is now set.
- Turn the voltage control to approximately 9.4. (See table below).
- Press and hold the STOP button.
- While holding the STOP button, press and hold the START button.
- While holding both the STOP and START buttons, press and hold the INCH UP button for one second.
- Release all the buttons. The voltage control maximum is now set.

Wire Diameter (Inches)	Voltage Control (Minimum)	Voltage Control (Maximum)
3/32	 5.8	 9.4
1/8	 7.2	 9.4
5/32	 8.1	 9.5
3/16	 8.5	 9.5

Amperage and voltage control sensitivity can be set back to the factory default by the following procedure:

- Press and hold the STOP button.
- While holding the STOP button, press and hold the START button.
- While holding both the STOP and START buttons, press and hold both the INCH DOWN button and INCH UP button for one second.
- Release all the buttons. The amperage and voltage control limits are now reset to the factory default.

6-5. Inside Panel Controls



1 Jog Speed

This control sets the speed at which welding wire is advanced out of the welding torch (Inch Down) or retracted into the torch (Inch Up).

2 Preflux Time

This control sets the length of time, 0 to 10 seconds, during which flux will flow before the arc starts. During this time, only the flux valve is active. Note: Flux valve remains active throughout the weld cycle.

3 Run-In Speed Control

This control sets the wire feed speed between the time the weld cycle begins and before an arc is established. After arc initiation, the wire feed speed is set by the front panel Wire Speed control.

4 Crater/Burnback Output Control

Use this control to set the output level of the power source while the weld cycle is in the crater fill and burnback modes.

5 Crater Speed Control

Use this control to set the wire feed speed while the weld cycle is in the crater fill mode.

6 Crater Time Control

This 0 to 5 seconds adjustable control sets the length of time the weld cycle stays in the crater fill mode. While in this mode, the power source output is set by the Crater/Burnback Output control rather than the front panel Output control. Also, the wire feed speed is set by the Crater Speed control rather than the front panel Wire Speed control.

7 Burnback Time Control

This 0 to 5 seconds adjustable control allows setting of the time the welding wire remains electrically energized after the drive motor stops. The burnback timer starts after the crater timer times out. By adjusting the control properly, the wire neither freezes in the weld puddle nor in the contact tube of the torch. If the wire freezes in the puddle, increase the burnback time. If the wire freezes in the torch, decrease the burnback time.

8 Postflow Time Control

This 0 to 5 seconds adjustable control allows setting of the time the flux valve remains activated after the Stop button is pressed. For Submerged Arc Welding, this control should be set to zero (0).

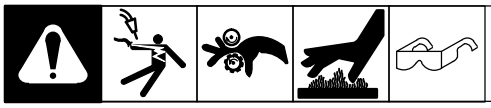
9 CC/CV Switch

Set this switch to tell the HDC 1500A whether you are using a constant current (CC) or constant voltage (CV) power source in the weld system. In CV mode, the controller feeds wire at a constant rate.

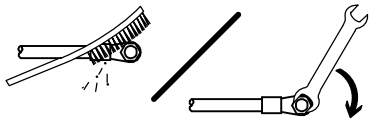
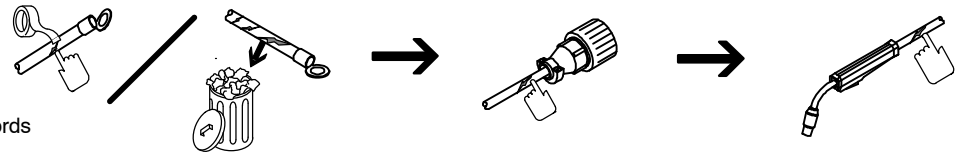
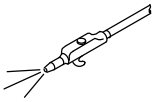
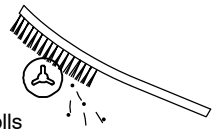
Ref. 803 023-B / 236 567-A / 236 566-A

SECTION 7 – MAINTENANCE & TROUBLESHOOTING

7-1. Routine Maintenance



Disconnect power before maintaining.

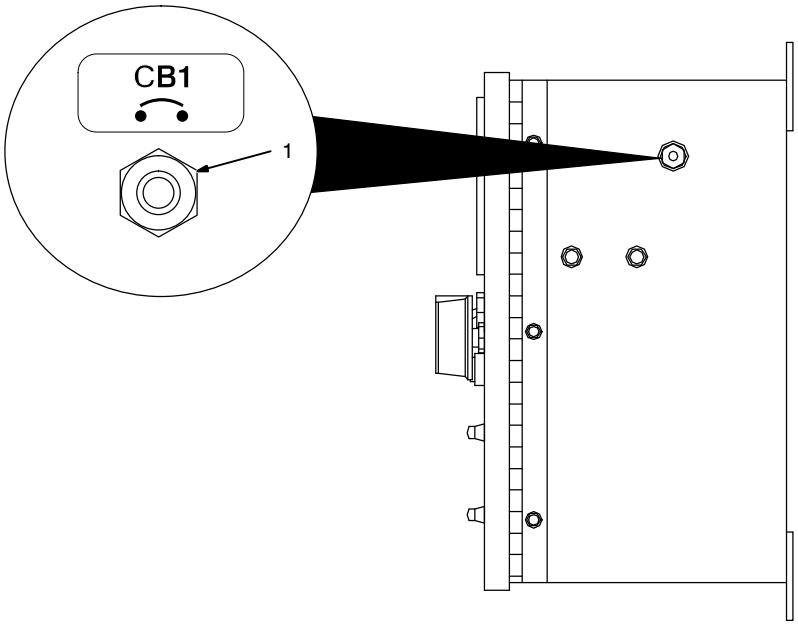
	✓ = Check ◇ = Change ● = Clean Δ = Repair ☆ = Replace * To be done by Factory Authorized Service Agent
Every 3 Months	 ✓☆ Labels ✓ ☆ Gas Hoses  ● Weld Terminals
Every 3 Months	 ✓Δ ☆Cables And Cords
Every 6 Months	 ●:During heavy service, clean monthly.  ● Drive Rolls

7-2. Supplementary Protector CB1

Turn Off welding power source and weld control.

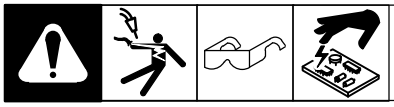
1 Supplementary Protector CB1

CB1 protects the HDC 1500A internal circuits from overload. If CB1 opens, all operations stop. Correct the problem, and press button to reset.



Ref. 803 022-C

7-3. Troubleshooting Table



Trouble	Remedy
Unit is completely inoperative.	Check supplementary protector CB1, and reset if necessary (see Section 7-2).
Wire does not feed during inching.	Place Power Switch S1 in On position (see Section 6-1).
	Check 115 volts AC input power and be sure it is energized.
	Check supplementary protector CB1, and reset if necessary (see Section 7-2).
	Jog Speed Control set too low; increase Jog Speed setting (see Section 6-5).
	Check wire feed motor, and repair or replace if necessary.
	Check Inch Up push buttons PB3 and Inch Down push button PB4, and replace if necessary (see Section 6-1 and Parts List).
	Have Factory Authorized Service Agent check control board PC1, and replace if necessary.
Wire feeds wrong direction during inching.	To change direction, add or remove jumper wire connecting Remote Prog to Remote Common.
Wire only feeds down whether Inch Down or Up button is pressed.	Have Factory Authorized Service Agent check control board PC1, and replace if necessary.
Wire does not feed after Start button is pressed (ensure that all wire feed inching functions are operating properly before checking this problem).	Check Start switch PB1, and replace if necessary.
	Run-In speed control set to low; increase run-in speed (see Section 6-5).
No wire feed speed control with Wire Speed control during welding, but speed can be controlled with Run-In speed control.	Check Output controls R9 and R10, replace if necessary.
	Check current feedback from power source. This signal, +1 volt DC per 100 amperes, can be measured on terminal strip TB1, terminal F, with respect to terminal D (see Section 5-7). HDC 1500A needs a signal of greater than 1 volt DC (i.e. >100 amps) for unit to go from run-in into weld parameters.
	Have Factory Authorized Service Agent check control board PC1, and replace if necessary.
No contactor control for welding power source (ensure that welding power source is working properly and that all connections are correct).	Check for contact closure from pin A to pin B. This can be measured on terminal strip TB1, terminal A, with respect to terminal B (see Section 5-7).
No output control for welding power source.	Check Output controls R9 and R10, replace if necessary.
	Check command signal on pin E. This signal can be measured on terminal strip TB1, terminal E, with respect to terminal D. Signal should go from 0 to voltage of C with respect to D as Output control is turned from min. to max.
No Crater mode.	Check to be sure Crater Output, Crater Speed, or Crater Time controls are not set to 0.
Erratic weld and no control of output.	Check remote voltage sense lead polarity, (see Section 5-5) for correct sense lead connections.

SECTION 8 – ELECTRICAL DIAGRAM

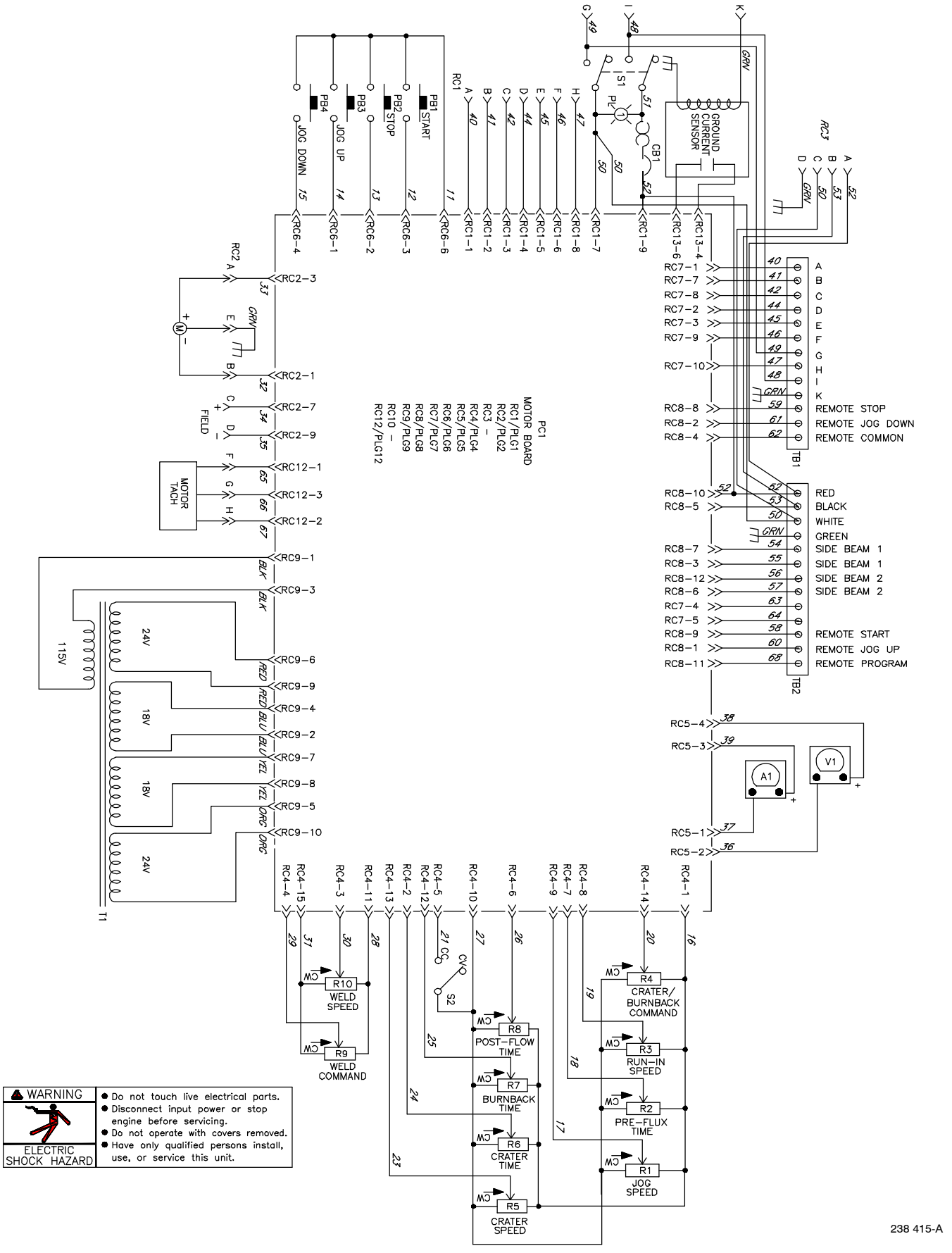


Figure 8-1. Circuit Diagram

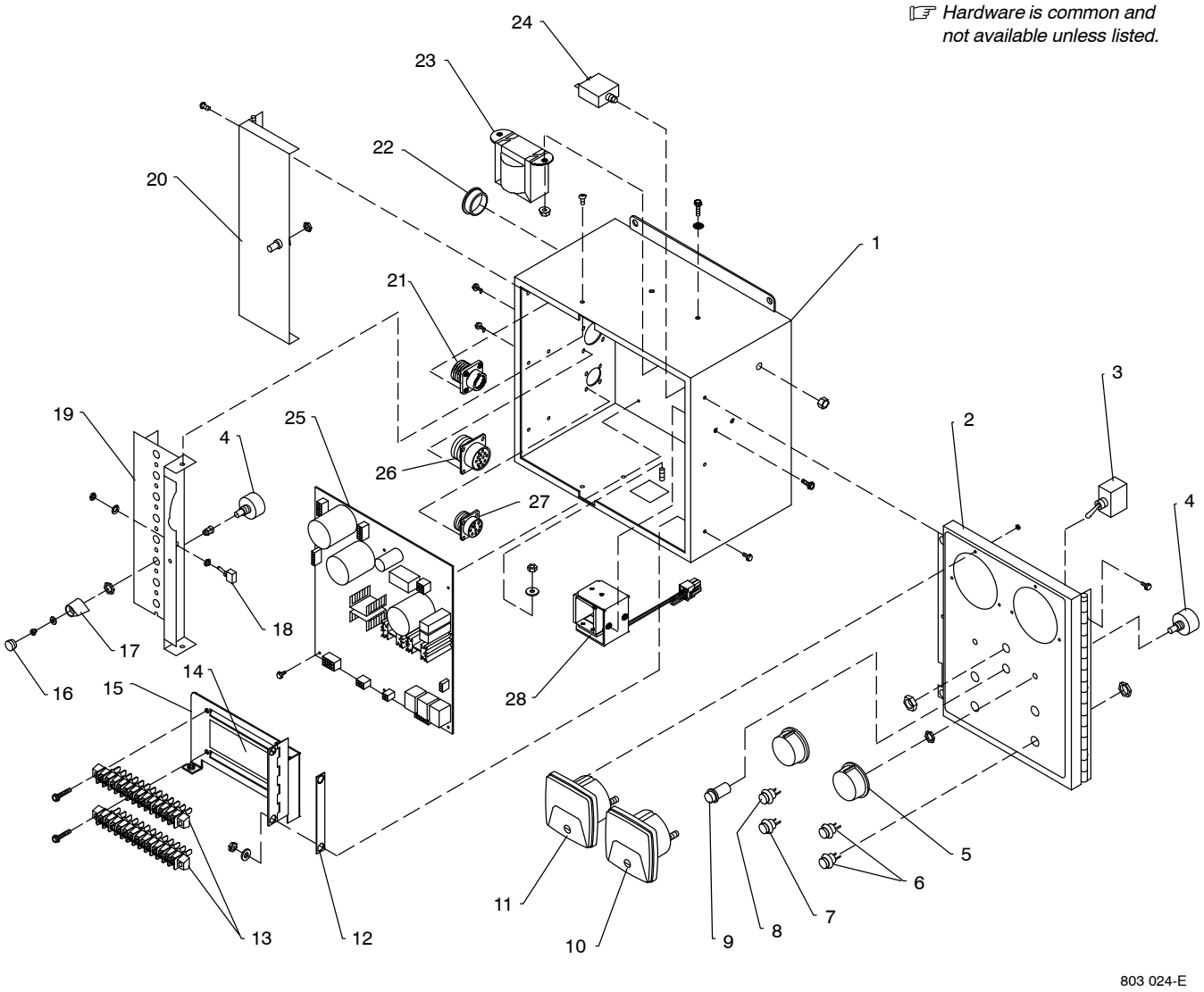


Figure 9-1. Control Box Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 9-1 Main Assembly	
1		214 799	Box, Enclosure HDC Assy	1
2		214 820	Cover, Right Box Enclosure	1
3	S1	028 111	Switch, Tgl Dpst 20A 250V SPD Term	1
4	R1-10	208 399	Potentiometer, Std Slot 1T 2W 10K	10
5		171 007	Knob, Pointer 1.670 Dia X .250 Id W/Set Screwsplstc	2
6	PB3, 4	202 944	Switch, Pb Mc No Spst 5A 115VAC (Gray)	2
7	PB2	202 945	Switch, Pb Mc No Spst 5A 115VAC (Red)	1
8	PB1	202 946	Switch, Pb Mc No Spst 5A 115VAC (Green)	1
9	PL	163 562	Light, Ind Wht Lens 125VAC Snap–In Neon Non–Relampa	1
10	A1	202 947	Meter, Amp 2 VDC 0–1500 Scale 3.5 In	1
11	V1	202 948	Meter, Volt 2 VDC 0– 60 Scale 3.5 In	1
12		214 816	Spacer, Terminal Strip Bracket	1
13		212 481	Block, Term 30 Amp 13 Pole Screw Term	2
14		230 939	Label, Terminal Strip	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 9-1 Main Assembly

15		214 805	Bracket, Terminal Strip	1
16		115 359	Cap, Peaked	8
17		154 339	Knob, Pointer .590 Dia X .250 Id W/Mtg Screw Plstc	8
18	S2	011 770	Switch, Tgl 6A	1
19		214 818	Bracket, Potentiometer	1
20		214 822	Cover, Left Box Enclosure	1
21	RC3	073 687	Conn, Circ Ms/Met 4Skt Size 14S Rcpt Panel Solder	1
22		070 371	Blank, Snap-In Nyl 1.093/1.125 Mtg Hole Black	1
23		221 404	XFMR, Control 30Va 24V/24V/18V/18V 115 PRI 50/60	1
24	CB1	083 432	Supplementary Pro, Man Reset 1P 10A 250VAC Frict	1
25	PC1	230 981	Circuit Card Assy, Motor Control W/Program	1
26	RC1	094 480	Connector, Cir Ms/Met 14Pin Size 20 Rcpt Panel Solder	1
27	RC2	139 268	Conn, Circ Ms/Met 10Skt Size 18 Rcpt Panel Solder	1
28		193 440	Switch, Ground Current Sensor	1
			Nameplate (Order by Model and Serial Number)	1
		236 567	Label, Pots	1
		236 566	Label, CC/CV	1
		155 436	Label, Ground/Protective Earth	1
		039 116	Label, High Voltage Test And Ground Ok	1
		236 565	Label, Warning Electric Shock Power Still Present (CE Version)	1
		236 767	Label, CB1	1
		236 226	Label, Remote Connections	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives you ...

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

Miller

TRUE BLUE® WARRANTY

Effective January 1, 2010
(Equipment with a serial number preface of MA or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
2. 3 Years — Parts and Labor
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
   * Inverter Power Sources (Unless Otherwise Stated)
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Smith 30 Series Flowgauge and Flowmeter Regulators (No Labor)
   * Transformer/Rectifier Power Sources
   * Water Coolant Systems (Integrated)
3. 2 Years — Parts
   * Auto-Darkening Helmet Lenses (No Labor)
4. 1 Year — Parts and Labor Unless Specified
   * Automatic Motion Devices
   * CoolBelt and CoolBand Blower Unit (No Labor)
   * External Monitoring Equipment and Sensors
   * Field Options (NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * RFCS Foot Controls (Except RFCS-RJ45)
   * Fume Extractors
   * HF Units
   * ICE Plasma Cutting Torches (No Labor)
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Load Banks
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * PAPR Blower Unit (No Labor)
   * Positioners and Controllers
   * Racks
   * Running Gear/Trailers
   * Spot Welders
   * Subarc Wire Drive Assemblies
   * Water Coolant Systems (Non-Integrated)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Work Stations/Weld Tables (No Labor)
5. 6 Months — Parts
   * Batteries
   * Bernard Guns (No Labor)
   * Tregaskiss Guns (No Labor)
6. 90 Days — Parts
   * Accessory (Kits)
   * Canvas Covers
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * M-Guns
   * MIG Guns and Subarc (SAW) Guns
   * Remote Controls and RFCS-RJ45
   * Replacement Parts (No labor)
   * Roughneck Guns
   * Spoolmate Spoolguns

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.

Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:	Welding Supplies and Consumables Options and Accessories Personal Safety Equipment Service and Repair Replacement Parts Training (Schools, Videos, Books) Technical Manuals (Servicing Information and Parts) Circuit Diagrams Welding Process Handbooks To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller
Contact the Delivering Carrier to:	File a claim for loss or damage during shipment. For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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